Research in Management of Technology and Business Vol. 2 No. 2 (2021) 281–296

RMTB

Homepage: http://publisher.uthm.edu.my/proceeding /index.php/rmtb
e-ISSN : 2773-5044

The Impact of Safety Culture and Safety Behaviour Towards Safety Performance: A Case Study of KTMB ETS Railway Maintenance Staff

Nor Aziati Abdul Hamid[1,*], Nur Azlin Suhaimi[1] & Muhammad Hazim Ismail[1]

[1]Department of Production and Operations Management, Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, Parit Raja, Batu Pahat, Johor, 86400, MALAYSIA

*Corresponding Author

DOI: https://doi.org/10.30880/rmtb.2021.02.02.022
Received 30 September 2021; Accepted 01 November 2021; Available online 01 December 2021

Abstract: A safety culture in general is an organizational culture that has a place in the high level of importance on safety beliefs, value, and attitudes. Poor safety performance in railway industry may increase the risk of accidents and threatened organization's safety. However, the previous study that focuses on safety culture in context of Malaysian railway is still lacking. Therefore, this paper aims to determine the relationship among safety culture and safety behaviour on safety performance using a case study of KTMB ETS in the perspectives of railway maintenance, as well as identifying the key factor that effecting railway safety performance. A sample size of 43 workers involving the technicians and engineers at ETS Maintenance Depot Batu Gajah taken for this study through the distribution of online survey and purposive sampling was used. Several statistical analyses such as descriptive analysis, normality test, correlation test. The result showed that independent variables of safety culture have a significant positive relationship with safety behaviour which led to only one of three hypotheses was accepted. Maintenance and facility and equipment were the most influential factors towards Safety Performance with coefficient value of 0.487. The study findings can further enhance and contribute to have a better understanding of relationships that influences the railway maintenance to help KTMB figure out a better approach to improve in the future as well as help to make suggestion on how to enhance the safety issues and when designing and regulating the safety management system, several policies suggestions can be helpful for the decision makers of rail system's operators and selected authorities.

Keywords: Safety culture, Safety behaviour, Safety performance, Railway maintenance, Electric Train Service (ETS)

**Corresponding author: aziati@uthm.edu.my*

1. Introduction

The growth of railway industry is shown in the expanding number of passengers over the last decades which are influenced by many factors such as the congestion of roads and air path, growing energy as well as demand to reduce emissions. In addition, the rising number of human populations globally has also leaded the demand for railway industry to increasing. A report issued in 15 July 2019 by the Department of Statistic Malaysia (DOSM) shown that Malaysia's residents in 2019 is expected to raise from 32.4 million in 2018 to 32.6 million (DOSM, 2019). Furthermore, with the growth in population, the usage of railway transportation is increasing as enticing alternative had put on stress to the rail infrastructure and limited time to maintenance. The quality of train services may be affected from elements such as railway facilities, stations facilities, operations, maintenance and policies (Yusoff, Ezwan, Safian, Bilal, & Yassin, 2019). Simultaneously, the performance and capacity of railway infrastructure is believed should be maintained or even enhanced at the same time. As the matter of fact, according to Lai & Bedi, (2019) Tun Dr. Mahathir Mohamad, said during the launched of the National Transport Policy (NTP) 2019-2030, the government will be focusing more in improving the railway network with the aim to have a developed rail system such as Japan, South Korea and China.

The fast-growing demand for an intelligent and highly competitive railway system has urged the existing rail networks to develop greater effective strategies in improving their performance. Railway system usually can give the safe, reliable, and fast transportation service to the passengers. Hence, safety culture is a main indicator of railway system safety (O'Toole, 2002). The weak interactions among humans and machines are the reason why accidents and system failure still happen. This is supported by Baysari *et al.* (2008), though the combined emphasis of technology and human factors, technical failures and human errors are still the main cause of safety related incidents. According to Ismail, (2019) reported in Berita Harian, where two companies were fined due to negligence on worker's safety, has shown that organization holds a major role in the development of safety culture among workers (Schulman, 2020). Nonetheless, the use of rail is increasing that requires the performance and capacity of rail infrastructure to be maintained or even enhanced for railways to be fast, reliable, and safe transportation. The improvements of safety performance might increase organization's shield or force as well as decreasing the accidents risks.

The key component in the strategic management process is performance measurement and improvement. In the use of assessments such as Public Performance Measure (PPM) and any other self-defined punctuality measures, the train operating companies view railway performance from the punctuality and reliability of their services. Punctuality is considered as a crucial measure of the performance of a railway system and generally used and discussed measure both in the industry and among travellers (Palmqvist, Olsson & Hiselius, 2017). In the relation of Keretapi Tanah Melayu Berhad (KTMB) in one of their service Electric Train Service (ETS), the key performance indicator (KPI) of punctuality is 90% of the train trip. Dhani and Sharma (2017) said punctuality is the characteristic of being able to complete a required task or fulfil an obligation before or at a previously designed time. Punctuality of the train has been linked to many factors and thus affecting the performance of the trains. Hence, this study attempts to investigate further on the safety culture that KTMB designed and safety behaviour among maintenance worker that involved with railway maintenance.

1.1 Research Background

(a) Keretapi Tanah Melayu Berhad (KTMB)

Keretapi Tanah Melayu Berhad (KTMB) or known as Malayan Railways is the main rail operator in Peninsular Malaysia. There are also other rail operators like Express Rail Link Sdn. Bhd., Prasarana Malaysia Bhd., and Sabah State Railway. KTMB is fully possessed by the Minister of Finance Incorporated, Ministry of Finance. Rail transport in Malaysia consist of light rapid transit (LRT), mass

rapid transit (MRT), monorails, express rail link (ERL), electric train service (ETS) and commuter. KTMB has experienced a transformation from conventional to modern train by means from diesel locomotive to modern train. KTMB received quite a high number of passengers every year which the main reason why they are the main rail operator in Peninsular Malaysia.

(b) Electric Train Services (ETS)

The Electric Train Service or ETS operated by KTMB is an intercity rail service using the electric multiple-unit (EMU) trains. The ETS services is the fastest metre gauge train that speed up to 140km/h and operates 36 trips daily between Gemas and Padang Besar, the border of Malaysia – Thailand. The ETS train coaches have two different types which are the KTM Class 91 from Hyundai Rotem and KTM Class 93 from CSR Zhuzhou, China. In 1995, KTM Komuter was introduced as the first electric train in Klang Valley area. Next, in 2010, the Electric Train Service (ETS) was introduced operating between Kuala Lumpur (KL) Sentral and Ipoh. In Northern sector, after the completion of electrified double track Ipoh to Padang Besar in 2014, the ETS Services has broaden up Padang Besar. Furthermore in 2015, a cross border service was introduced in which the Shuttle Tebrau service that operates between Johor Bahru (JB) Sentral and Woodlands. As shown in Table 1, ETS service has a number of 3.9 million passengers in 2019 (Ministry of Transport Malaysia, 2019). In addition, by second quarter of 2020, a total of 951,000 passengers used ETS service (Jaapar, 2020) just show that ETS is rising in demand due to its affordable service, fast and safe as well as fairly reliable. Nonetheless, the study on its safety performance of railway maintenance has low attention thus that makes the aims of this study.

Table 1: Number of Intercity Rail Passengers (Ministry of Transport Malaysia, 2019)

	Intercity Rail	
Year	KTM ETS	KTM INTERCITY
2017	4,147,634	3,092,299
2018	3,933,093	3,527,137
2019	3,901,858	3,746,367

1.2 Problem Statements

According to the International Railway Safety Council (2020), there are few common risks supervised by the railway industry which are train collisions, derailments, level or grade crossings and trespass, railway staff risks, stations, suicides and dangerous goods. The application of the organizational safety culture concept in aviation and other sectors have influenced health and safety officers, accident investigators and researchers involved in railway safety to apply the concept to rail. The Federal Railroad Administration (FRA) also encourages railroad operators to build strong safety cultures by developing innovative methods, processes, and technologies to address the risk factors that cause accidents and injuries (Nævestad, Hesjevoll & Phillips, 2018). An analysis done by Safety and Health Magazine (2018), stated that travelling using commuter or intercity railways is 18 times safer than travelling by vehicles which also helps to improve safety for everyone in the respect of transportation industry.

Information received from one of KTMB ETS Maintenance Depot staff in Batu Gajah (Jumiran, personal communication, 2021) stated that workers are obligated to attend a safety training related to their occupation which called as Course 038. He also stated that there are no accidents recorded from 2019 until 2020. Besides that, there is also no official safety officer appointed at the workplace. To add more, he also said that there are no reports on safety and accidents at workplace to be mentioned in a management meeting. For any accidents or injuries suffered by worker while working, if the injury is not serious, the worker will receive treatment at workplace only. From the information given, it can be concluded that even though there are no accidents that happened in between year 2019 to 2020 and

safety training is compulsory for every worker, there might be not enough communication between workers and management regarding safety issues. In addition, Pintelon and Muchiri (2009), mentioned in their study that compared to other occupation, maintenance workers were 8 to 10 times more vulnerable to occupational diseases even though the accident rate in maintenance was fairly smaller when compared with the national average. However, to some maintenance specialties, the rate of accident was much higher compared to the average.

In the 10th Malaysia Plan, the direction plan for government in the development of Malaysia over the next few years, the improvement in quality of life in urban area and a worry for environmental issues but there are few straight references to public transportation. Latest studies have focused on identifying the underlying causes of failures, hence become a reason why the need to yet study on the framework of relationships between, safety culture and safety behaviour that leads to perceive safety performance. For instance, previously Baysari *et al.* (2008) research had found that there was at least one organizational factor that became the reason why there is technical and human failures and error such as lack of maintenance. To add on, a news reported in 2013 stated that a railway maintenance worker was killed while his partner suffered serious injuries after being hit by a train during carried out inspection on a railway, the investigation result by Department of Occupational Safety and Health (DOSH) found out that the workers had failed to comply with the Safe Operating Procedure (The Star Online, 2013).

Moving on, Kalteh *et al.* (2019) mentioned in their study that by increasing level of safety culture may help in reducing the number of accidents. This supported by a news reported by FMT (2016), where two of KTMB trains, ETS and Express Rakyat collided resulted three passengers suffering minor injuries. An investigation has been conducted and showed that there was a human error which is negligence of the train drivers. In addition, Yusoff *et al.* (2019) mentioned in their study that to accommodate operators in order to provide good service, the facilities on trains and stations are necessary. This supported by Silva (2018) reported in The Star where KTMB was fined RM60,000 by a Sessions Court due to the failure in making sure their railways and coaches were in good condition and safe to use. Moreover, the issue on KTMB did a poor job in the maintenance of its tracks and coaches has encouraged researcher to have a better understanding on safety behaviour that affecting safety performance in maintenance at KTMB.

Latest studies have focused on identifying the underlying causes of failures, hence become a reason why the need to yet study on the framework of relationships between, safety culture and safety behaviour that leads to perceive safety performance. Due to the rising issues, this study wants to determine the relationships among safety culture, safety behaviour and safety performance hence researcher will adopt the framework by Cheng (2011) from Taiwan Railway System which key dimensions with factors analysis of Safety Culture: Communication and Emergency, Safety Management; Safety Performance: Reliability, Maintenance, Facility and Equipment. However, the key dimension of Safety Behaviour: Mutual aid among workers, Relationship between superior and subordinate, Participation in suggestion-making, Self-control, is taken from Li *et al.*, (2020) framework. Thus, it will become a new proposed framework by researcher.

2. Literature Review

2.1 Safety Culture

The safety culture issue is very crucial in an organization since the safety of people beginning with managers to staffs as well as customers and frequently, the investment of money and of time is needed (Srathongkhruen & Fraszczyk, n.d.). A definition taken from Piers, Montijn and Balk (2009) defined that a Safety Culture refers to the range in which every individual and every group of the organization is conscious of the risks and unknown hazards convinced by its activities; is continuously behaving so

as to preserve and improve safety; is willing and able to adapt itself when facing safety issues; is willing to communicate safety issues; and consistently evaluates safety related behaviour. Onen (2016) stated safety culture is a term where nearly everyone uses, however only a few can agree upon its precise meaning or how it can be measured. Based on previous study has shown that in an organization other important aspect affecting safety procedures for instance safety culture, safety behaviour and safety climate must be evaluated when accepting a risk management method. According to the staff (Jumiran, 2021) at ETS Maintenance Depot in Batu Gajah they would coordinate public safety campaign twice a year. Other than that, they updated their Occupational Safety and Health (OSH) bulletin twice a year as well as organizing OSH day four times a year or sometimes they also change it into OSH week where the aim of the event is to spread safety awareness for the staff. According to Guldenmund (2000), referred safety culture as the shared values, norms, beliefs and ideas about safety within an organization and it is important in the shape and definition of how safety is introduced and merged in the daily processes, tasks and management of organization (Wishart, Rowland, & Somoray, 2019).

2.2 Safety Behaviour

According to Hofmann, Morgeson and Gerras (2003), safety behaviour is when workers behaviour performed that go higher and over activities related to safety are described within their normal work role. Khan, Makhbul and Kaliannan (2019) mentioned in their study that when safety compliance and participation demonstrated by an individual, they may influence other employees within the organization. The potential advantages that improving safety behaviour will be sketch and within the organizational setting, the safety-related activities may occur and the complementary paradigm important to the enhancement of safety culture is suggested to be perceived as safety behaviour (Wishart *et al.*, 2019). Cheng (2011) mentioned safety culture has influenced safety behaviour which are by enhancing the safety culture of an organizational internally, it will be able to improve the attitude and perception of employees regarding safety behaviour. Hence, the concept of safety behaviour is recommended to be an essential concept related to safety and promotion, and may guide to improving individual commitment and personal responsibility (Wishart *et al.*, 2019).

2.3 Safety Performance

Asamani (2020) mentioned the rate of accident tends to be widely used in measuring safety performance. There is no fixed definition on safety performance. However, this study would like to take definition from a thesis by Nevhage and Lindahl (2008), where safety performance defined as the quality of safety-related work where it is viewed as the efforts made to achieve safety. Sangiorgio, Mangini and Precchiazzi (2020) mentioned the railway accidents in history occurred due to several causes for instance accidents that happened because of human errors. According to data by European Railways Agency (2018), the total figure of accidents involves unauthorized persons on the railway tracks that were hit by a train were more than half (57%) and the other category including accidents involving pedestrians. This category made up 26% with 447 total accidents in 2018. The word safety performance can be described as safety achievement of service provider while interpreted by safety performance measurement and aims (International Collaboration Group, 2013). The main issue of any type of transport system could be reviewed in the safety and security issue (European Commission, 2020). This is because of passengers' expectation on the transportation is to be safe. Three key elements in safety performance are reliability, maintenance, and facility and equipment (Ismail *et al.*, 2017).

(a) Reliability

The reliability element may be defined as the capability of systems or operations to carry out their tasks that are vital under stated requirement for a fixed period of time given (Vromans, 2005). The issues related to safety and reliability or rail services is being developed in scientific research all the time (Konowrocki & Chojnacki, 2020). Furthermore, in early stage such as designing the railway, the rising in level of operational reliability and safety were also given a thought.

(b) Maintenance

As for maintenance element is the task in ensuring the operating condition is proper and the asset is also being kept in good condition (Ismail *et al.*, 2017). The railway infrastructure maintenance is one of the main aspects to receive a well-functioning transportation system. The good condition in train operation may avoid the failure in operating is the victorious missions to aim by the maintenance department (Gulati & Smith, 2013). According to Railway Technical Web pages 1998 – 2016, inspections in ensuring the ability and the condition of locomotive, wheel, railway track, wagon, ballast, braking system, and coach in functioning well must be done regularly to avoid and reducing any risk. Even though activities related to maintenance can be costly and expensive particularly in the transportation industry, but it will require much higher cost to replace the failing equipment if failing to do so.

(c) Facility and Equipment

The facility and equipment element in the railway transportation is the property or assets that mostly functioning in operating the rail in easy and efficiency (Ismail *et al.*, 2017). As long as the company is in business, the safety practices should be a continuously maintaining and re-evaluating process. Compared to the elements that set out as the central in designing a safe railway station facilities and equipment adding a safe access to the station and within the station, having the sense of security where ensuring the passengers can see and be seen, sense of safety in case of emergency where it is accessible through clear emergency procedure and assistance (Mohd Akabal *et al.*, 2017). From the research, safety performance is considered as an essential element that affecting passenger satisfaction by improving the rail safety. A diagram that illustrated the safety performance measurement has shown as below.

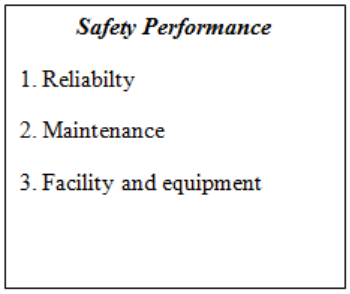

Figure 1: Safety performance measurement

2.4 Safety Performance

Organizational safety behaviour has major influence on safety behaviour of railway workers and eventually affect the safety performance in railway working area (Cheng, 2011). A study of safety culture showed that the Safety Officer of an organization managed safety seminars in order to give reward such as prize money and zone-wide appreciation towards employees that have good safety behaviour (Bugalia, Maemura, & Ozawa, 2019). It shows how the organization with good safety behaviour among workers might as well give effect on good safety performance. Ismail *et al.*, (2017) stated that by an on-going improvement of the rail safety must be enhance particularly in term of maintenance by KTMB not only will affecting the safety culture among KTMB workers but eventually will attract more people in making the rail transport as their main serviceable public transport. Safety climate can forecast safety behaviour as well as a mediator role among safety climate and accidents at workplace plays by safety behaviour (Liu *et al.*, 2015). Thus, human effort and project conditions on lessen the injuries is influencing safety culture (Kalteh *et al.*, 2019) may be alternatives to railway maintenance.

H_1: Safety culture has significant positive influence towards safety behaviour

2.5 Safety Behaviour and Safety Performance in Railway Maintenance

Safety is defined as the risks that related to transport activities that are effectively controlled and reduced to a satisfactory level and linked to, or indirect support of the operation of transport (Ismail *et al.*, 2017). International Collaboration Group, (2013) defined safety performance is when its safety performance aims, and safety performance indicators is the service provider's safety achievement. In Cheng (2011) paper, through a structural equation modelling (SEM) analysis has proven that organization will have the potential to improve their safety performance with a mature safety culture within the organization. Through safety culture such as safety compliance and employee's participation in it, individuals' attitude in maintaining safety practices can give a major improvement in an individual's safety performance (Khan *et al.*, 2019). The railway maintenance employees' behaviour and views towards safety in organization influenced by the organization's safety behaviour and measures taken by organization for safety issues hence it will eventually transform employees' behaviour and safety behaviour in the future (Li *et al.*, 2020). Safety performance in railway maintenance could be influenced by the safety behaviour or employees that perform the task.

H_2: Safety behaviour has significant positive influence towards safety performance

2.6 Safety Culture and Safety Performance in Railway Maintenance

According to Kalteh *et al.* (2019), the aftermath of changes in safety culture can be showed in the long run. Most studies recommended that safety culture dimensions that are statistically operative for safety performance criteria being interventional factors in subsequent studies. There could be potential interventions between safety culture and safety performance (Kalteh *et al.*, 2019). The railway maintenance and operation job scope mostly require workers to work on-site hence the previous study suggested to organizations in having extra face-to-face communication opportunities with the frontline staff members by sharing thoughts on safety in spite the physical distance (Cheng, 2019) in which may help to further do further improvement on safety performance of the railway maintenance.

H_3: Safety culture has significant positive influence towards safety performance

2.7 Proposed Conceptual Framework and Hypotheses.

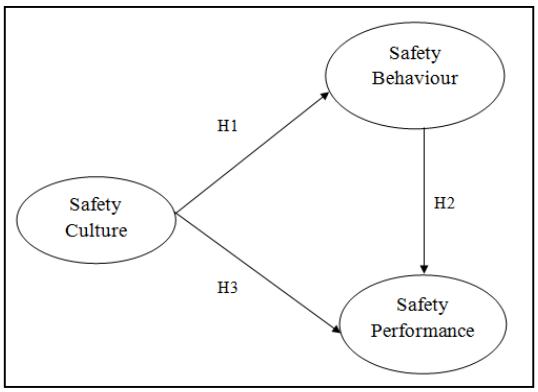

Figure 2: Proposed conceptual framework

H1: Safety culture has significant positive influence towards safety behaviour.

H2: Safety behaviour has significant positive influence towards safety performance.

H3: Safety culture has significant positive influence towards safety performance.

3. Research Methodology

3.1 Research Design

The approach used in this study is a quantitative approach to investigate both first and second objectives. The quantitative method is focusing in identifying the key dimensions of safety culture, safety behaviour and their relationships to safety performance. This method also being used to focus more on how safety culture provides a frame of reference that guides individuals' interpretations of actions, hazards, and their identities and which one moves and normalize behaviours that have impact on safety performance. This study designated to be conducted at KTMB. For this research, the researcher used the purposive sampling to collect the data from the targeted population, which is the ETS Maintenance, Depot in Batu Gajah to its benefits and to suit with the researcher constraint in collecting the data during the on-going global pandemic issue. The population of KTMB workers as a whole would be more or less at 5,800 workers (Tan *et al.*, 2020). However, for this study researcher focused on the total population at ETS Maintenance, Depot in Batu Gajah, Bukit Tengah, Padang Besar and Gemas which is 86 workers to suits this study which the sample studied is the KTMB ETS workers that may consist of executives, managers, technicians, engineers, and administrators. The estimated sample size will be 43 workers from the whole population in maintenance staff that involved in maintenance from all mentioned ETS maintenance Depots. To determine the relationship among independent and dependent variables, the researcher used an online survey-based questionnaire distributed using Google Form to the main area of the study which is ETS Maintenance staff at KTMB in Batu Gajah.

In this study, researcher is using the Google Form which is a web-based app used to create forms that will help for the distribution of online questionnaire to the respondents and data collection (Love, 2014). Google Form is a great free option available online that can be shared to the selected respondents through link, email, and others hence it attracts researcher to make use these tools. Furthermore, after the data collection it is easier and fast for researcher to classify and pre-analysed the data because all the collected data will be kept in a spreadsheet.

Descriptive analysis was used to help in describing the features of specific data set in a meaningful way through a short summary on the sample and measures of the data (Hayes, 2021). The data gathered is demonstrated in simpler interpretation in the form of mean, percentage, standard deviation, and result interpretation. The data collected from the respondents was examined through the usage of IBM SPSS Statistics version 22 for complex statistical data analysis. The researcher conducted pilot test by using Cronbach's Alpha to test the internal consistency. Pilot test for the study was conducted and a total of 10 completed questionnaires were obtained from the respondents. A pilot test was carried out to measure the validity and reliability of the questionnaires. According to the finding of pilot test, the Cronbach's Alpha of overall reliability statistics was 0.945, which was considered as excellent. By combining all the items from safety culture, safety behaviour and safety performance (reliability, maintenance, facility, and equipment) there was a total of 25 items tested in the reliability test. However, due to low Cronbach's Alpha value on safety culture, researcher decided to delete an item to raise the Cronbach's Alpha value. As a result, only 24 items remain to be used during actual data collection. The Cronbach's Alpha value for the variables was within the range of 0.831 to 0.967. For the analysis after the actual distribution of survey questionnaire, a reliability test was conducted again to have the overall reliability of the study. Besides, a normality test was conducted to check whether the questionnaires were normally distributed. Correlation test was used to study the relationship of safety culture, safety behaviour and safety performance., and approach. The methodology adopted in carrying out the study should be well explained.

3.2 Construct Measurement

The research survey is composed of four main parts. Section A were divided into two parts, section A (i) represented the respondent's demographic information (8 questions). In this section, nominal and ratio measurements are used. Section A (ii) represent the kinds of policies and system in place to make the workplace safe (Institute for Work & Health, 2016) where ordinal measurement was used. There are 25 items in overall for section B, C, and D and ordinal measurement was used as the scale. Section B represents the independent variable of Safety Culture (Cheng, 2011) and section C for Safety Behaviour (Li *et al.*, 2020). Section D represents the dependent variable, Safety Performance: Reliability (M. A. Ismail *et al.*, 2017), Maintenance (Cheng, 2019) and Facility and Equipment (Cheng, 2019). To measure the respondent's agreement on the statement, a 5-point Likert Scale was used for measuring the agreement, likelihood, frequency, quality and many more. According to Tripathi, (2020) a 5-point Likert Scale allows respondents to understand the questions easier as well as increasing the response rate. The scales used are as follows: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree and 5=Strongly agree. Refer: Table 2 and Table 3.

Table 2: Construct measurement

Part	Variables		Measurement	Scale of Measurement
A (i)	Gender		Nominal	-
	Race		Nominal	-
	Age		Ratio	-
	Educational level		Nominal	-
	Year of service		Ratio	-
	Position		Nominal	-
	I am required to attend a safety course every year		Nominal	Yes/No
A (ii)	Workplace policies & procedure		Ordinal	5-point Likert Scale
B	Safety culture		Ordinal	5-point Likert Scale
C	Safety behaviour		Ordinal	5-point Likert Scale
D	Safety performance	Reliability	Ordinal	5-point Likert Scale
		Maintenance	Ordinal	5-point Likert Scale
		Facility & Equipment	Ordinal	5-point Likert Scale

Table 3: Instrument development for the study

1. Workplace Policies and Procedures (WPP)	
WPP1	Everyone receives the necessary workplace health and safety training when starting a job, changing jobs, or using new techniques
WPP2	There is regular communication between employees and management about safety issues
WPP3	Systems are in place to identify, prevent and deal with deal hazards at work
WPP4	Workplace health and safety is at least as important as production and quality
WPP5	There is an active and effective health and safety committee and/or worker health and safety rep
WPP6	Incidents and accidents are investigated quickly to improve workplace health and safety
WPP7	Communication about workplace health and safety procedures is done in way that I can understand
2. Safety Culture (SC)	
SC1	All workers informed about emergency plan.
SC2	When accidents occur, current emergency handling plan should be able to solve such incidents.
SC3	Management has established in writing the functions of commitment and participation and the responsibilities in safety for all organization members.
SC4	Written declaration is available to all workers reflecting management's concern for safety, principles of action and objectives to achieve.
SC5	There is a fluent communication embodied in periodic and frequent meetings, campaigns, or oral presentations to transmit principles and rules of action.
3. Safety Behaviour (SB)	
SB1	I will help other workers to ensure their safe work.
SB2	I will encourage workers to participate in safety exercises and other safety matters.
SB3	I will help the workers learn the rules and regulations of safe work.
SB4	I will take the initiative to protect the workers from dangerous situations.
SB5	I will report the hidden danger of work safety accidents to the superior in time.

4. Safety Performance – Reliability (R)	
R1	I ensure the highest levels of safety when I carry out my job.
R2	I help my co-workers when they are working under risky or hazardous conditions.
R3	Accidents and incidents reported, investigated, analysed, and recorded.
R4	Resolutions frequently adopted that originated from consultation with or suggestions from workers.
R5	When organization adopt staffs' safety proposals rewards are given.
5. Safety Performance – Maintenance (M)	
M1	The safety inspections are conducted before maintenance.
M2	Maintenance instructions and procedures are written well and can be understood.
M3	Use the correct safety procedures when carrying out the job.
M4	When performing regular maintenance, organization can immediately handle appropriately to solve safety problems.
M5	Ensuring the railway and service environment is kept in a good condition.
6. Safety Performance – Facility and Equipment (F)	
F1	Organization provides the safety equipment.
F2	Over the past year, the failure rate of equipment failure decreased.
F3	Over the past year, break-down of railway machinery equipment decreased significantly.
F4	A regular inspection on safety equipment before carrying out the job is a must.
F5	Ensuring the signage and guidance in case of emergency are clear.

4. Results and Discussion

4.1 Demographic Profile Analysis

The researcher was able to collect all 43 respondents from the targeted sample. From the data collected the total of male respondents is 42 (97.7%) and female is 1 (2.3%). Malay workers contributed to the highest participation with 42 in total (97.7%), and 1 respondent (2.3%) from Indian worker. Most the respondents aged between 26 to 34 years old with 21 in numbers (48.8%), followed by 19 respondents from 35 years old to 49 years old (44.2%), and 3 respondents (7.0%) aged from 50 to 64 years old. A total of 25 (58.1%) had their skill certificate, 12 respondents (27.9%) who had diploma, 4 respondents (9.3%) had their bachelor's degree, 1 respondent (2.3%) who only had their master's degree, and only 1 (2.3%) had primary or secondary education. A total of 26 (60.5%) were Technician, 14 (32.6%) were from others position, and 3 (7.0%) of them were Engineer. Most of them had 1 to 5 years of service with a total of 14 (32.6%), followed by 13 (30.2%) those who had 11 to 15 years of service, 9 (20.9%) who had over 15 years of service, and 7 respondents (16.3%) who had 6 to 10 years of service. Respondents who are required to attend a safety course every year had stated yes, were 35 (81.4%), and no, 8 (18.6%). Respondents who stated yes, they are familiar with the safety policies regulation of the company were 41 (95.3%) and no were 2 (4.7%).

4.2 Reliability of Real Study

Firstly, Cronbach's Alpha for safety Culture was 0.652 and this value is considered as moderate. Next, the Cronbach's Alpha for safety behaviour was 0.555 resulted from one item was deleted to increase the reliability which can be interpreted as acceptable. Besides, the Cronbach's Alpha for reliability was 0.679 which can be interpreted as moderate, maintenance was 0.878 considered as high and facility and equipment, 0.896 which also considered as high reliability. This indicates that the questionnaire being used for the research was satisfactory and appropriate enough to ensure the reliability and validity of the research. The summary of the results is shown in Table 4.

Table 4: Reliability test for the actual study

Variables	No. of Items	Cronbach's Alpha	Delete Item
Safety Culture	5	0.652	1
Safety Behaviour	5	0.555	1
Safety Performance:			
Reliability	5	0.679	0
Maintenance	5	0.878	0
Facility and Equipment	5	0.896	0

4.3 Descriptive Analysis

To summarize and describe the data in a logical way, a descriptive statistic is used. The central tendency is measured using mean, while standard deviation is analysed to identify the dispersion of value. From the data, the mean score for safety culture ranged between 3.6047 to 4.0698 which is considered as a high central tendency. The standard deviation of the safety culture is between 0.50028 and 0.61090, which means that the data score is clustered closely to the mean. The mean range for safety behaviour is between 4.1628 to 4.2326 which is considered as high central tendency. The standard deviation of safety behaviour is 0.39375 to 0.57447. The mean range for safety performance dimensions (reliability, maintenance, and facility and equipment) was between 3.6744 to 4.2326, 3.4419 to 3.9767 and 2.8605 to 3.8837 respectively. Besides, the standard deviation is between 0.33773 to 0.64442, 0.46231 to 0.83062 and 0.62524 to 1.05968 respectively.

4.4 Normality Test

The normality tests are used to determine whether the data set is well-modelled by a normal distribution and to compute how likely it is for a random variable underlying the data set to be normal distributed. In this study, since the sample size is smaller than 50, the Shapiro-Wilk test results are used. According to Mishra *et al.* (2019), a significance value of higher than 0.05 indicates that the data were normal while below than 0.05 indicates that the data were abnormal. Based on the descriptive results, all the significance value for each variable in the study is less than 0.05. Thus, the researcher concluded that the data of this study was not normally distributed.

Table 5: Normality test result

	Shapiro-Wilk		
	Statistic	df	Sig.
Safety Culture	0.875	43	0.000
Safety Behaviour	0.849	43	0.000
Reliability	0.745	43	0.000
Maintenance	0.839	43	0.000
Facility and Equipment	0.908	43	0.002

4.5 Spearman's Correlation Analysis

As the data was not normally distributed, the Spearman's rho correlation coefficient is used to measure the strength and direction of the monotonic relationship between the variables in this study. The value of correlation coefficient may be varying between -1 to +1, the larger the value, the stronger the relationship. According to the results, safety culture towards safety behaviour shows the correlation coefficient value of 0.41, safety behaviour towards safety performance dimension (reliability – R, maintenance – M, facility, and equipment – F) 0.15 (R), 0.229 (M) and 0.007 (F), and safety culture towards safety performance dimension (reliability – R, maintenance – M, facility, and equipment – F) was 0.074 (R), 0.074 (M) and 0.329 (F). Besides, the correlation coefficient value of workplace policies and procedures to safety performance dimension (reliability – R, maintenance – M, facility, and equipment – F) was -0.124 (R), 0.461 (M) and -0.060 (F). The result for relationship between workplace policies and procedures to safety performance dimension can be refer at Table 8. Among all variables only correlation coefficient between safety culture towards safety behaviour was accepted at the p value of 0.01 which mean less than 0.05. Thus, the rest variables have a weak relationship or no significant. However, the relationship between workplace policies and procedures to safety performance dimension (reliability – R, maintenance – M, facility, and equipment – F) shows a strong relationship on reliability and maintenance.

Table 6: Correlation coefficient between safety culture safety behaviour to safety performance

	Correlation Coefficient Safety performance: Reliability (R)	Sig. (2-tailed)	Correlation Coefficient Safety performance: Maintenance (M)	Sig. (2-tailed)	Correlation Coefficient Safety performance: Facility & Equipment (F)	Sig. (2-tailed)
Safety Culture	.074	.792	0.74	.638	.329*	0.31
Safety Behaviour	0.15	.923	.229	.139	.007	.965

Table 7: Correlation coefficient of safety culture to safety behaviour

	Safety Behaviour Correlation Coefficient	Sig. (2-tailed)
Safety Culture	0.41	.792

Table 8: Correlation coefficient to see the relationship between workplace policies and procedure towards safety performance

	Correlation Coefficient Safety performance: Reliability (R)	Sig. (2-tailed)	Correlation Coefficient Safety performance: Maintenance (M)	Sig. (2-tailed)	Correlation Coefficient Safety performance: Facility & Equipment (F)	Sig. (2-tailed)
Workplace Policies and Procedures	-.124	.429	.461**	.002	-.060	.074

4.6 Discussions

(a) First Objective

From the study, it was found that safety culture had a positive and moderate relationship with safety behaviour as the coefficient value was 0.41 with p-value less than 0.05. This indicated that the hypothesis generated where there is a significance positive influence among safety culture and safety behaviour was accepted in this study. According to Cheng (2011), has mentioned in his study that positive safety culture would influence safety behaviour if there is an improvement on safety culture within organization. In order to reduce the number of incidents and accidents, it is important to develop a positive safety culture (Derahim *et al.*, 2021). Through an interview conducted by Li *et al.* (2020), has found out that instead of thinking deeply on whether the behaviour of superior is right or wrong, the employees' point of view and behaviours regarding safety issues are usually obtained from following their superiors' thoughts and acts. To develop positive safety culture within organization it is necessary for leadership to also take part for instance a chief executive should raise, and symbolize as well, a commitment to safety as a top, or if not, as priority in an organization (Schulman, 2020).

The correlation coefficient value between safety behaviour towards safety performance dimension (reliability – R, maintenance – M, facility and equipment – F) was 0.15 (R), 0.229 (M) and 0.007 (F) with p-value more than 0.05 which indicated that the hypothesis generated where there is safety behaviour has significant positive influence towards safety performance was rejected in this study because only safety behaviour towards safety performance dimension of maintenance (M) shows a weak relationship and the rest are negligible. However, based on mean and result, the central tendency for safety behaviour among KTMB workers indicates that there is a high central tendency in their safety behaviour at workplace. As for the relationship between safety culture towards safety performance dimension (reliability – R, maintenance – M, facility and equipment – F) show correlation coefficient value of 0.074 (R), 0.074 (M) and 0.329 (F) thus the hypothesis generated on safety culture has significant positive influence towards safety performance is also rejected in this study due to only safety

culture towards safety performance dimension of facility and equipment (F) shows a weak relationship and the rest are negligible. Nonetheless, the central tendency for safety culture among KTMB workers as shown in the mean result is high. Thus, this indicates that the level of safety culture among KTMB ETS Maintenance workers is indeed high.

Table 9: Summary of hypotheses results

Hypotheses	Spearman Correlation (rs)	Sig. (2-tailed)	Interpretation	Inference
H1: Safety culture has significant positive influence towards safety behaviour	0.41	0.792	Moderate	Accepted
H2: Safety behaviour has significant positive influence towards safety performance.	0.15 (R) 0.229 (M) 0.007 (F)	0.923 (R) 0.139 (M) 0.965 (F)	Negligible Weak Negligible	Rejected
H3: Safety culture has significant positive influence towards safety performance.	0.074 (R) 0.074 (M) 0.329 (F)	0.792 (R) 0.638 (M) 0.31 (F)	Negligible Negligible Weak	Rejected

(b) Second Objective

The second objective aims to identify which one is the important factor among reliability, maintenance and facility and equipment that influences railway safety performance the most. From Table 10 shows it was found that among safety performance maintenance and facility and equipment has a moderate relationship which considered the highest coefficient value and the most influential factor with p-value at 0.05. According to Mohd Akabal *et al.* (2017), facilities and equipment adds a safe access to the station and it also may give a sense of safety towards workers to do their job. In addition, the malfunction of equipment is one of the contributors to accidents at workplace (Sugiono *et al.*, 2020). Therefore, the second objective and question of this study has been achieved and answered.

Table 10: Correlation coefficient of safety performance dimensions

	Correlation Coefficient Safety performance: Reliability (R)	Sig. (2-tailed)	Correlation Coefficient Safety performance: Maintenance (M)	Sig. (2-tailed)	Correlation Coefficient Safety performance: Facility & Equipment (F)	Sig. (2-tailed)
Safety Performance: Reliability	-	-	0.381*	0.12	0.82	0.12
Safety Performance: Maintenance	0.381*	0.12	-	-	0.487**	0.01
Safety Performance: Facility & Equipment	0.382*	0.12	0.487**	0.01	-	-

5. Conclusion

Both research objectives had been successfully being achieved and answered. However, 2 out of 3 hypotheses were rejected in this study and only one hypothesis accepted. The first research objective which to determine the relationship among safety culture, safety behaviour and safety performance from railway maintenance perspectives has indicated that only safety culture and safety behaviour have a significance positive relationship and the rest are either weak relationship or negligible. This objective was tested using the Spearman Correlation analysis as the results from normality test showed that the data is not normal. Besides, the maintenance and facility and equipment had the highest correlation coefficient value which can be considered as the most influential factors influencing railway safety performance. This study provides a valuable contribution and information to the railway industry in the aspect of safety in rail and safety among workers at the workplace in the viewpoint of railway maintenance workers. The study also highlighted two main limitations. Firstly, the researcher

distributed the questionnaire through an online Google Form to the targeted respondents. According to Vasantha & Harinarayana (2016), among the issue associated with online survey was poorly chosen distribution channels that can lead to biased data and lack of interviewer to clarify any inquiry when respondent fill in the survey may also lead to less reliable data (Howard, 2019). Secondly, researcher also takes longer time collect data from targeted respondents because they are a working organization, so they need to find a suitable time to fill in the survey. Finally, during conducting the study researched was lacked time and issue such as global pandemic has prevent the researcher from visiting the actual maintenance site at ETS Maintenance Depot in Batu Gajah, so researcher had limitation to have a better view of the actual maintenance site.

To further improve it is suggested for future researchers to distribute the survey questionnaire in person for targeted respondents by making appointment beforehand so they can allocate some time to focus in answering the questionnaire. Thus, future researchers can have a better accuracy and reliable data. Next, future researchers can use the mixed research method to understand in depth on the study. The usage of qualitative method will give a better and detail exploration on the case studies and will add more value on the topic of the research. Moreover, future researchers may study different type of rail service such commuter, light rail transit (LRT) and others. Finally, it is recommended for future researcher to conduct the study in a longer period to gain better information and a better report construction.

References

Asamani, L. (2020). Promote Safety Culture and Enhance Safety Performance through Safety Behaviour. European Journal of Business and Management Research, 5(4), 1–11. https://doi.org/10.24018/ejbmr.2020.5.4.405

Baysari, M. T., McIntosh, A. S., & Wilson, J. R. (2008). Understanding the human factors contribution to railway accidents and incidents in Australia. Accident Analysis and Prevention, 40(5), 1750–1757. https://doi.org/10.1016/j.aap.2008.06.013

Bugalia, N., Maemura, Y., & Ozawa, K. (2019). Safety Culture in High-Speed Railways and The Importance of Top Management Decisions. (955). Retrieved from https://www.adb.org/publications/safety-culture-high-

Cheng, Y. H. (2011). Safety culture, Safety behavior and safety performance in Railway companies. Challenge H: For an Even Safer and More Secure Railway, 1–21.

Cheng, Y. H. (2019). Railway safety climate: a study on organizational development. International Journal of Occupational Safety and Ergonomics, 25(2), 200–216. https://doi.org/10.1080/10803548.2017.1361591

Department of Statistics Malaysia. (2019). Current Population Estimates, Malaysia, 2018-2019. Retrieved from Department of Statistic Malaysia Official Portal website: https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=155&bul_id=aWJZRkJ4UEdKcUZpT2tVT090Snpydz09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09%0A0.%0A

Derahim, N., Arifin, K., Isa, W. M. Z. W., Khairil, M., Mahfudz, M., Ciyo, M. B., … Samad, M. A. (2021). Organizational safety climate factor model in the urban rail transport industry through cfa analysis. Sustainability (Switzerland), 13(5), 1–18. https://doi.org/10.3390/su13052939

Dhani, P., & Sharma, T. (2017). The Impact of Individual's Emotional Intelligence on His/Her Job Performance: An Empirical Study in Indian Context. International Business Management, 11(7), 1419–1428. https://doi.org/10.3923/ibm.2017.1419.1428

European Commission. (2020). What is the EU doing to improve security and safety of transport in the EU? Retrieved from European Union website: https://ec.europa.eu/transport/themes/security_en

European Railways Agency ERA. (2018). Report on Railway Safety and Interoperability in the EU 2018. Retrieved from https://www.era.europa.eu/sites/default/files/library/docs/safety_interoperability_progress_reports/railway_safety_and_interoperability_in_eu_2018_en.pdf

FMT. (2016, May). ETS, Express Rakyat collision caused by human error. Free Malaysia Today. Retrieved from https://www.freemalaysiatoday.com/category/nation/2016/05/21/ets-express-rakyat-collision-caused-by-human-error/

Gulati, R., & Smith, R. (2013). Maintenance and reliability best practices. Industrial Press Inc.

Guldenmund, F. (2000). The nature of safety culture: a review of theory and research. Safety Science, 34(1–3), 215–257.

Hayes, A. (2021). Descriptive Statistics. Retrieved from Investopedia website: https://www.investopedia.com/terms/d/descriptive_statistics.asp

Hofmann, D. A., Morgeson, F. P., & Gerras, S. J. (2003). Climate as a moderator of the relationship between leader-member exchange and content specific citizenship: Safety climate as an exemplar. Journal of Applied Psychology, 88(1), 170–178. https://doi.org/10.1037/0021-9010.88.1.170

Howard, C. (2019). Advantages and Disadvantages of Online Surveys. Retrieved from https://www.cvent.com/en/blog/events/advantages-disadvantages-online-surveys

Institute for Work & Health. (2016). Workplace health and safety survey. Retrieved from https://www.iwh.on.ca/sites/iwh/files/iwh/tools/ohs_vulnerability_measure_questionnaire_2016.pdf

International Collaboration Group. (2013). Measuring Safety Performance Guidelines for Service Providers.

International Railway Safety Council. (2020). Common Risks Managed by the Railway Industry. Retrieved from https://international-railway-safety-council.com/common-risks-managed-railway-industry/

Ismail, M. A., Latip, L., Kahsan, N. S., & Wan Jusoh, W. N. A. (2017). The Measurement of the Safety Performance towards Passenger Satisfaction in Rail Transport. 417–426.

Ismail, S. (2019, July 31). Two companies were fined for neglecting safety to the point of employee death. Berita Harian. Retrieved from https://www.bharian.com.my/berita/kes/2019/07/590995/dua-syarikat-didenda-abai-keselamatan-hingga-pekerja-maut

Jaapar, N. (2020). Bilangan Penumpang dan Kilometer Penumpang Mengikut Kelas. Retrieved from https://www.data.gov.my/data/en_US/dataset/bilangan-penumpang-dan-kilometer-penumpang-mengikut-kelas-2009

Kalteh, H. O., Mortazavi, S. B., Mohammadi, E., & Salesi, M. (2019). The relationship between safety culture and safety climate and safety performance: a systematic review. International Journal of Occupational Safety and Ergonomics, 1–31. https://doi.org/10.1080/10803548.2018.1556976

Khan, Z., Makhbul, M., & Kaliannan, M. (2019). Hubungan Antara Budaya Keselamatan Dan Prestasi Keselamatan Dalam Sektor Perkilangan: Sikap Keselamatan Sebagai Faktor Pengantara. E-Bangi, 16(5), 1–13.

Konowrocki, R., & Chojnacki, A. (2020). Analysis of rail vehicles' operational reliability in the aspect of safety against derailment based on various methods of determining the assessment criterion. Maintenance and Reliability, 22(1), 73–85.

Lai, A., & Bedi, R. S. (2019, October 18). Govt to Focus on Driving Rail Transport. The Star. Retrieved from https://www.thestar.com.my/news/nation/2019/10/18/govt-to-focus-on-driving-rail-transport

Li, M., Zhai, H., Zhang, J., & Meng, X. (2020). Research on the relationship between safety leadership, safety attitude and safety citizenship behavior of railway employees. International Journal of Environmental Research and Public Health, 17(6). https://doi.org/10.3390/ijerph17061864

Liu, X., Huang, G., Huang, H., Wang, S., Xiao, Y., & Chen, W. (2015). Safety climate, safety behavior, and worker injuries in the Chinese manufacturing industry. Safety Science, 78, 173–178. https://doi.org/10.1016/j.ssci.2015.04.023

Love, C. (2014). 5 Reasons to Use Google Forms with Your Students. Retrieved from TechnoKids website: https://www.technokids.com/blog/apps/reasons-to-use-google-forms-with-your-students/

Ministry of Transport Malaysia. (2019). Bilangan Penumpang dan Kilometer Penumpang Mengikut Kelas 2019. Retrieved from https://www.mot.gov.my/my/land/reports/quarterly-statistics-of-rail-transport

Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive Statistics and Normality Tests for Statistical Data. Annals of Cardiac Anaesthesia, 22(1), 67–72. https://doi.org/10.4103/aca.ACA_157_18

Mohd Akabal, F., Mohd Masirin, M. I. H., Akasah, Z. A., & Md Rohani, M. (2017). Review on Selection and Suitability of Rail Transit Station Design Pertaining to Public Safety. IOP Conference Series: Materials Science and Engineering, 226(1). https://doi.org/10.1088/1757-899X/226/1/012033

Nævestad, T. O., Hesjevoll, I. S., & Phillips, R. O. (2018). How can we improve safety culture in transport organizations? A review of interventions, effects and influencing factors. Transportation Research Part F: Traffic Psychology and Behaviour, 54, 28–46. https://doi.org/10.1016/j.trf.2018.01.002

Nevhage, B., & Lindahl, H. (2008). A Conceptual Model, Methodology and Tool To Evaluate Safety Performance in An Organization. Lund University.

O'Toole, M. (2002). The relationship between employees' perceptions of safety and organizational culture. Journal of Safety Research, 33(2), 231–243. https://doi.org/10.1016/S0022-4375(02)00014-2

Onen, V. (2016). Aviation Safety Culture Measurement Model Fit Validation of a Aviation Safety Culture Measurement Model Fit Validation of a Survey for the Aviation Maintenance. International Journal of Research - Granthaalayah, 4(3), 1–21.

Palmqvist, C. W., Olsson, N. O. E., & Hiselius, L. W. (2017). Some influencing factors for passenger train punctuality in Sweden. International Journal of Prognostics and Health Management, 8(Special Issue on Railways & Mass Transportation), 0–13.

Piers, M., Montijn, C., & Balk, A. (2009). Safety Culture framework for the ECAST SMS-WG. European Commercial Aviation Safety Team (ECAST), 1–14.

Pintelon, L., & Muchiri, P. N. (2009). Safety and Maintenance. In M. Ben-Daya, S. O. Duffuaa, A. Raouf, J. Knezevic, & D. Ait-Kadi (Eds.), Handbook of Maintenance Management and Engineering (pp. 613–648). https://doi.org/10.1007/978-1-84882-472-0

Safety and Health. (2018, December). Public transportation is 10 times safer; analysis shows. The National Safety Council. Retrieved from https://www.safetyandhealthmagazine.com/articles/17905-public-transportation-is-10-times-safer-for-commuters-analysis-shows

Sangiorgio, V., Marcello, A., & Precchiazzi, I. (2020). A new index to evaluate the safety performance level of railway transportation systems. Safety Science, 131(August), 1–13. https://doi.org/10.1016/j.ssci.2020.104921

Schulman, P. R. (2020). Organizational structure and safety culture: Conceptual and practical challenges. Safety Science, 126(February), 104669. https://doi.org/10.1016/j.ssci.2020.104669

Silva, J. E. De. (2018, March 22). KTMB fined RM60,000 for poor maintenance of its tracks and coaches. The Star. Retrieved from https://www.thestar.com.my/news/nation/2018/03/22/ktmb-fined-rm60000-for-poor-maintenance-of-its-tracks-and-coaches/

Srathongkhruen, S., & Fraszczyk, A. (n.d.). Safety Culture in a Railway Maintenance Environment: A Case Study of Bangkok Metro Network. In Urban Rail Transit (pp. 41–59). https://doi.org/https://doi.org/10.1007/978-981-15-5979-2_3

Sugiono, N., Kusrini, E., Ali, J., & Miranda, S. (2020). The Effect of Employee, Management, Working Environment, and Safety Culture on Occupational Health and Safety Performance: A Case Study in an Oil and Gas Company in Indonesia. The International Journal of Integrated Engineering, 12(7), 268–279.

Tan, T., Carvalho, M., Sivanandam, H., & Rahim, R. (2020, August 12). KTMB has not retrenched anyone, plans to hire more in future, says Wee. The Star. Retrieved from https://www.thestar.com.my/news/nation/2020/08/12/ktmb-hasnt-retrenched-anyone-plans-to-hire-more-in-future-says-wee

The Star Online. (2013, March 14). Maintenance Worker Dead, One Injured After Being Hit by ERL Train. Department of Occupational Safety and Health (DOSH). Retrieved from https://www.dosh.gov.my/index.php/ms/archive-news/2013/733-maintenance-worker-dead-one-injured-after-being-hit-by-erl-train

Tripathi, N. (2020). Everything you need to know about Likert Scale. Retrieved from The CX Insider website: https://www.surveysensum.com/blog/everything-you-need-to-know-about-the-likert-scale/

Vasantha, R., & Harinarayana, N. S. (2016). Online survey tools: A case study of Google Forms Online. National Conference on "Scientific, Computational & Information Research Trends in Engineering, GSSS-IETW, Mysore, 1(1), 1–12.

Vromans, M. (2005). Reliability of Railway Systems (62nd ed.).

Wishart, D., Rowland, B., & Somoray, K. (2019). Safety Citizenship Behavior: A Complementary Paradigm to Improving Safety Culture Within the Organizational Driving Setting. Traffic Safety Culture, (April), 145–171. https://doi.org/10.1108/978-1-78714-617-420191011

Yusoff, H. M., Ezwan, E., Safian, M., Bilal, K., & Yassin, A. M. (2019). the Criteria of Railway Station in Malaysia: A Review of Issues in Facilities Improvement. Sci.Int.(Lahore), 31(2), 283–287.